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## Headache in the canon of medicine

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### Abstract

Our current research includes shedding light on Ibn Sina's Canon of Medicine book, which is the comprehensive encyclopedia of medicine and the source that researchers refer to until the present time. The Canon of Medicine is divided into five medical volumes that are taught in many universities in the world. It includes many explanations, including an explanation of the sciences of anatomy, an explanation of drugs, compounds, diseases and their most important causes, inferences and partial treatments with a simple medicine, and other explanations, as Ibn Sina revealed many scientific, experimental and laboratory theories. Some pathological conditions that are related to the brain have been referred to. These cases are related to Ibn Sina's Book of Canon of Medicine. The research also included a set of statistics that we documented of the 250 primary headache cases; (tension headache 130, migraine headache 100, and cluster headache 20), and the 250 secondary headache cases; (cervicogenic headache 120, fever associated headache (flu, covid, and meningitis) 35, and brain tumor, and others 15). The total number of headache cases that we have documented is 420 cases in various cases, with a variety of treatment methods and the selection of the appropriate medication to treat each case alike.

**Keywords:** avicenna, canon of medicine, headache

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### Introduction

Avicenna is the Muslim scholar and physician known as Abu Ali, and he is considered one of the most important physicians and scientists specializing in astronomy, as well as one of the philosophers and writers in the golden age witnessed by Islam, <sup>[1]</sup> and he is considered the father of early modern medicine <sup>[2, 3, 4]</sup>. Avicenna was born in the village of Afshana, which is located near the Bukhara region in present-day Uzbekistan. His father is came from a city called Balkh, which is in present-day Afghanistan, and his mother is considered a villager. The date of his birth was in the year (370 A.H) (980 A.D) and he died in the city of Hamadan, which is located in present-day Iran, in the year (427 A.H) (1037 A.D). He was known as the chief Sheikh and was called by westerners the Prince of Physicians, as well as the father of modern medicine in relation to the Middle Ages. Avicenna wrote about 200 books on various topics, many of which shed light on philosophy and medicine. Among the most famous works and achievements of Avicenna are the book of Healing, a philosophical and scientific encyclopedia, and the Canon of Medicine, a medical encyclopedia <sup>[5, 6, 7]</sup> which soon became a standard medical text taught in many medieval universities. It was also used as late as 1650 of the last century <sup>[8]</sup>. In addition to philosophy and medicine, Avicenna's manuscripts included writings related to astronomy, chemistry, geography, geology, psychology, as well as Islamic theology, logic, mathematics, physics, and works of poetry. He translated the book into Latin during the 12.th century, which be used as a reference-text throughout Europeans universities until the mid-17.th century. As well as description of 600 potential medications for widespread illnesses. Avicenna also characterized the anatomy of body organs and parts, like the eyes and the heart. He also mentioned the effectiveness of plant and its root on the human body. An opener of medical assist was his working on the effectiveness of congeals on limiting the diffusion of disease, arguing that a forty days period of the self-isolations were fundamental for stopping the infections from affecting of others. There are many details of Avicenna's life, he wrote an autobiography which has been complemented with materials from a biography written by one of his students. His autobiography is not simply as an accounting of his life, but its written to clarify his ideas of reached the ultimate truth, so it must be accurately explicated. A helpful critical-edition of this autobiography evidences in <sup>[9]</sup>, while there is a new translation shows in <sup>[10]</sup>.

### Head diseases from Ibsina's perspective

Avicenna had a methodical ways in explain of pathological conditions regarded the head based on the anatomy and physiology of the brain. He stated that the head composition which represented by the brain, meninges, and blood vessels that reached blood to the brain. The contributions of Avicenna in several disciplines of sciences greatly influenced not only the medical practices in the Arabic or Islamic area, but also in the European medicine <sup>[11]</sup>. The (ds) In the brain result from abnormalities in the size of the head, it's either smaller than the regular size or larger which could lead to a perceivable malfunction. The abnormality of blood vessels lead to disease if it's blocked. The ventricles contains (csf) if they're blocked, the abnormality occurs in any ventricle or its parts.

Pathological conditions can result from herniation. It can also result from tumors. Either in the brain or its meninges. He explained this on the basis of the Greek theory of temperaments:

### Humorism

"Humors" define as the concept which might have initiated in Mesopotamia although it was arranged by Greek medicine, overwhelmingly, it is Hippocrates who is credited with applied this connotation to medicine. He proposed that there are four humors related with the individual physiology and pathology conditions, are <sup>[12]</sup>:

- a. Blood.
- b. Yellow bile.
- c. Black bile.
- d. Phlegm.

Hippocrates posited forever with alcmæon that an maximum excess or reduce in those body fluids can be an indicate of disease, their imponderable which described as dyscrasia, and their evenness as eucrasia, and Galen progressed on this opinion by the identification of four temperaments among the four qualities (moist, hot, dry, cold) predominated. Then, this theory was adopted by polymath Avicenna's assignment (the canon of medicine), in his work he summarised this four (humors and temperaments) as the following in table no. (1):

**Table 1:** Diseases correlated to other tissues or organs such as pleurisy base on which the situation of the brain can be located either through a sensual functions such memorizations, thinking, imaginations, or motion functions. head shape, its conditions, and the scalp such as which located on ulcerations and swellings in the external position of the scalp (skin), the eyes colour, hairs thickness with its colour, or its susceptibility to transient to gray, neck condition, slim and long, teeth indicators which leads to diseases of the brain, individual's emotional state such as the continual feeling of sadness and other related diseases.

Humor	Season	Age	Element	Organ	Temperaments
Blood	Spring	Infancy	Air	Liver	Warm and moist Sanguine
Yellow bile	Summer	Youth	Fire	Gallbladder	Warm and dry Choleric
Black bile	Autumn	Adulthood	Earth	Spleen	Cold and dry Melancholic
Phlegm	Winter	Old age	Water	Brain/Lungs	Cold and moist Phlegmatic

### The evidences that indicate of brain dysfunction

An individual's behaviours can gives for a useful provenance of information related to the brain's functions, the normal actions indicates to the healthy brain, but the opposite behaviours indicate to (distortion, attenuation, or cessation) of fundamental functions. Avicenna mentioned that headache, asphyxia, vertigo, hemiplegia, anxiety, dark vision, and weak as clinical manifestations of stroke <sup>[13]</sup>.

### Vision

Its summarized to the following points that related with:

1. Near sightedness
2. 2-Visual manifestation of non-existent things (hallucinations)
3. Loss off function, loss of visibility, etc.

### Hearing

hearing loss come from the defect of conductivity, so the patient will only hear a high voices, or hearing some things which isn't normally heard like out coming from wind or purring of water which is called (tinnitus).

### Smelling

either weak or related to smelling perfect or not good smells, that might be traced back to presence of humours in the anterior lobe. While as for tasting and touching, they do not have big differ than the other senses. Instinct and delusion can be sign of temper and weakness can indicate to disorder behaviour. The diagnosis of this is still ambiguous until trouble of each other function has been observed, for example: weakness of individual's

imagination and envisionment. However, if the a mentioned functions which powerful then it may indicate well-being of the anterior lobe and individual's ability to differentiate patterns and shapes, etc. Disproportionate linkage in imaginations and outer stimulus indicate to confused imaginativeness. These are indications of dryness moist, or cold anterior lobe.

Poor verdict leads to the result of unbalanced tempers of the brain, so this can indicate to tumour, or yellow bile-dry, or black-bile (melancholy).

### **Motor Dysfunction**

Weakness or deficiency of motor functions is indicate to clammy humour in each organ and may drive to brain regarded diagnosis. Motor-dysfunction can include one-half of the body longitudinal in hemi-paralysis. Facially paralysis can also mark to brain dysfunction due to the drying of temperament in one of the central originated neurones. If a motor defective occurs in a single organ, it could be depiction back to a dysfunction related to the organ itself or the brain, that conditions either happen suddenly (indicate of moist-temperament) or progressively (that is indicate of dry-temperament) for example of an sudden dysfunction would be epileptic-seizure (indicate of moist-temperament). Seizures can occur because of an embolus partly imprison the vessels, this condition refers to dry-temperament in the brain.

### **Signs of brain dysfunction can also be observed in hair, tumors and ulcers**

(Ex: Pustules): Pulsation, tetanus, and vertigo could refer to main problem correlated with blood-supplying to the brain (indicate to yellow-bile) deduction dragged from individuals variations:

One temper can be predominant in a healthy, and don't cause indicates of any disease, the same temperament however once spotted in overflow in another individuals could be an indicate of disease. indicates to a comparatively minus genetic material through the evolution of the fetus, while big size of head indicates to high genetic material, it's status the small sizes indicate of anything, reduced of the total particularity of the brain, whereas larger sizes don't necessarily point to a high brain quality. Small sized heads gives a sense of the any status of the brain that anticipated to be poor.

### **Eye-tongue uvula tonsils neck nerves**

#### **Eye**

colour of sclera yellow, grey or red, lacrimal gland secretions Blinking, sunken eyes or Exophthalmos, abnormal lacrimation if not due to a dysfunction in the organ itself then it could be due to moisture in the frontal lobe of the brain Especially if this dysfunction is occurring in one eye only Excessive blinking may indicate a psychological problem. Exophthalmos can be indicative of brain tumors Sunken eyes can be due to some atrophied parts in the brain. Avicenna described the observation of objects as it isn't a beam of light that exodus from the eye hitting an object, but, it is the beams of light emitted from an object and pass through the transparent part of the eye (lens) making vision-possible <sup>[14]</sup>. Ibn Sina described elaborately defined the six extraocular muscles and the trigeminal nerve. His work about the eye made high contributions in the anatomical understanding and validity of this organ <sup>[15]</sup>.

#### **Tongue**

observing the colors, white, yellow or black tongue, the tongue mainly indicates disorders regarding the GIT however if a brain dysfunction is expected or observed than the tongue could be considered a sign of that dysfunction. Facial color should also be observed, red color could possibly indicate polycythaemia, yellowish look can be indicative of jaundice Brain dysfunction can also cause difficulty in micturition It can lead to respiratory arrest, this is traced back to the fact that the brain shares function with different body systems, One organ that is significantly related to the brain is the stomach, it's condition can be observed throughout patient's appetite, their digestion, eructation, nausea and hiccups. Heat and yellow bile could lead to these conditions. Site and onset of pain If the pain starts at the head and descends down to the shoulders it could worsen with poor digestion.

### **Headaches**

All pains are the result of unbalanced temperament, pain can be from brain or meninges or vessels, tissues external to the cranium:

1. Dysfunction in liver, spleen, lung etc can't also lead to having headache, by causing a fever that leads, later on, to headache.
2. Occlusion due to Embolus leads to unbalanced temperaments and dilation of the vessel containing the embolus which could possibly lead to Resolution of continuity in the meninges.
3. Headache could be caused by external factors such as alcohol consumption (alcoholic headache) Headaches can be classified according to specific regions of the head where pain is felt:
  - a. occur on one side of the head (migraine).
  - b. occur at the head-front.
  - c. occur at the head-back.
  - d. involve the entire of head.

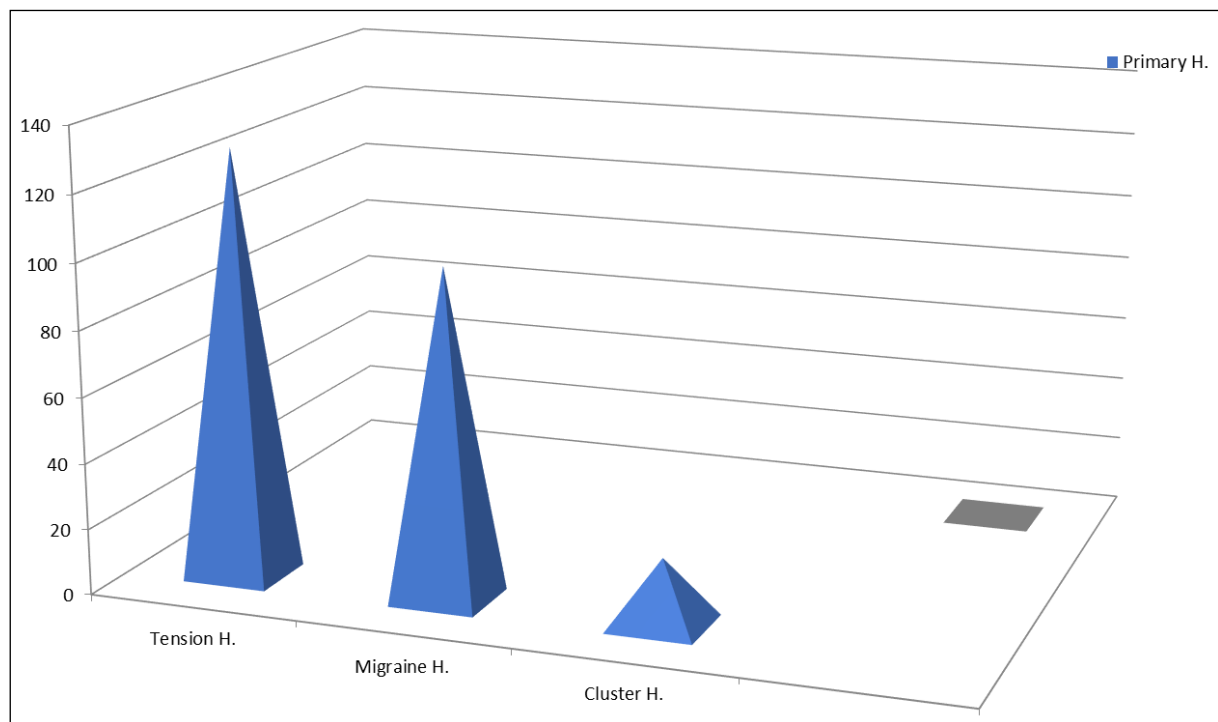
A headache differs in severity according to reference, Headaches can either be moderate or can be painful. Highly sensible individuals may have headache in a bigger hesitation than others. It is possible that the headache is accompanied by some spasms that may be chronic. Chronic headaches are mainly caused by black bile, phlegm or may be caused by a specific tumor. The presence of toxins in the body may also lead to headaches, and this may lead to insufficient necessary nutrients that must reach the brain cells, and therefore headaches may be due to a lack of blood sugar. While a migraine may occur due to some eating some foods such as garlic, some types of seafood, etc. Headache exacerbates most of the time at high temperatures, and this may cause death, especially if it is related to nosebleeds. The poor psychological state and discomfort associated with headaches are accompanied by a lack of sleep time and affect sexual desire. Consisting of about a million words in Arabic, it is elaborately classified into five books dealing with several affections and treatments <sup>[16]</sup>.

We have followed up the headache cases of the patients who visited the Headache Clinic of Al-Hajah Hospital in Karbala city during the period from (2019-2022), and we noticed that the headache cases that we supervised are divided into two types: (primary and secondary headaches), as shown in Table No. 2 below:

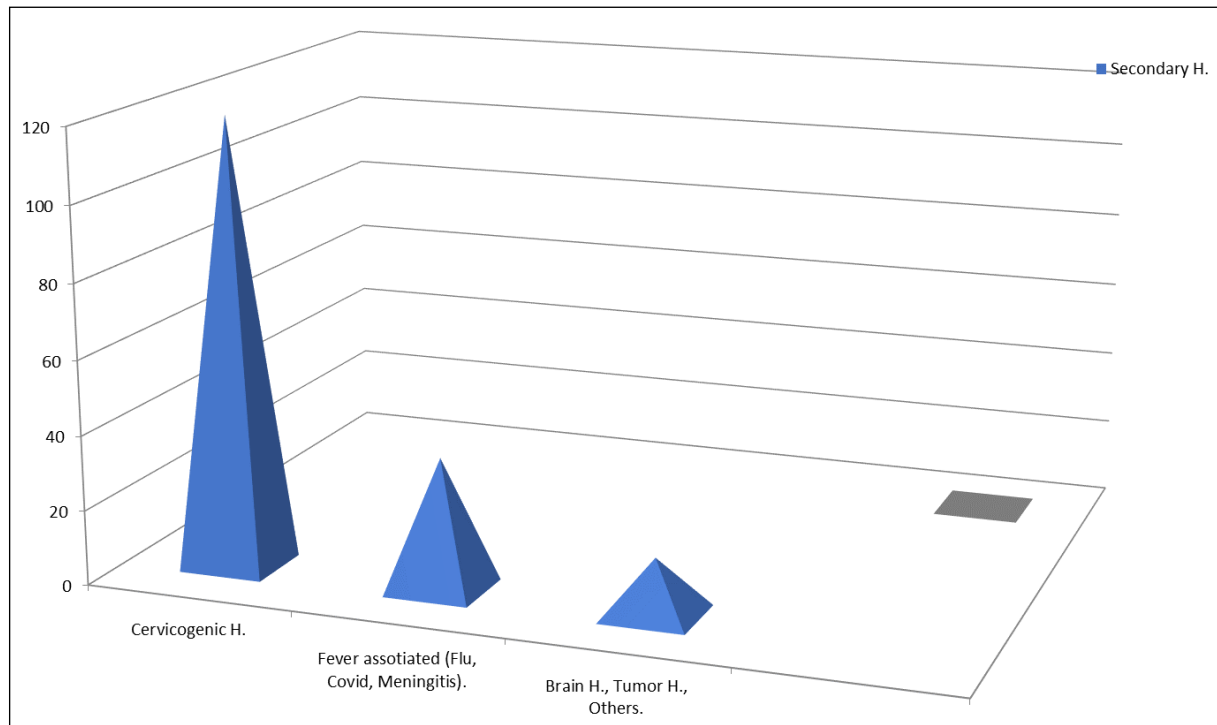
**Table 2:** The total number of headache cases are (420 cases) divided to two types: (primary and secondary headache), documented from (2016-2022) in Headache Clinic at Imam Al-huja Hospital:

Case Types of Headache		Case number
Cases of Primary Headache (250 cases).	Tension Headache.	130
	Migraine Headache.	100
	Cluster Headache.	20
Cases of Secondary Headache (170 cases).	Cervicogenic Headache.	120
	Fever associated: (Flu, Covid, and Meningitis).	35
	Brain Tumor, and Others.	15
Total number of headache cases		(420 cases)

Each type of primary and secondary headache includes a group of cases that differ in their number, conditions and reasons for their occurrence, and therefore there will be a difference in the treatment methods also according to the type of headache and its condition. The statistics indicated that the number of primary headache cases amounted to about (250 cases) that included (Tension Headache, Migraine Headache, Cluster Headache), this was clarified in Figure 1, while the number of secondary headache cases amounted to approximately (170 cases) that included (Cervicogenic Headache, Fever associated (Flu, Covid, and Meningitis), Brain Tumor, and Others), as shown in figure no. 1 and figure no. 2:



**Fig 1:** to show the values of primary headache with types.



**Fig 2:** to show the values of secondary headache with types.

Headaches may be primary or secondary, primary headaches are directly related to changes in brain chemicals and biological developments at the cellular level, in addition to any defect in the function of blood vessels and nerves, as well as muscle tension that occurs in the head or neck area, according to what has been done. It is observed in cases of headaches that are treated by different means, either with a specific treatment that is commensurate with the pathological condition and what is related to it, or by following instructions that we recommend to the patient to adhere to and follow. Treating headaches should be quick by referring the patient to medical clinics specialized in neurology, so that the situation does not worsen and become more complex than it is. Knowing the causes of headaches in order to get rid of them and treat them is also important in determining the type of illness that the patient suffers from.

### Conclusion

We conclude through our current research that headaches can be treated as long as there are approved medical and physiological sources that can be referenced and approved to help us in this matter. It should also be noted the importance of Ibn Sina's book "The Canon of Medicine", in which he put many solutions to many diseases, especially headaches of all kinds. We conclude through our current research that headaches can be treated as long as there are approved medical and physiological sources that can be referenced and approved to help us in this matter. It should also be noted the importance of Ibn Sina's book "The Canon of Medicine", in which he put many solutions to many diseases, especially headaches of all kinds. We also concluded in our research that the multiplicity of headache types and the different rates and rate of injuries from one person to another is according to what the individual goes through from the different life circumstances that made him suffer from a specific case of headaches that must be treated, whatever the amount and its impact on the sick person, especially And the development of various treatments for such a disease has become available, provided that the patient does not take it without the guidance of a specialist doctor.

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